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RUSTS AND SMUTS COLLECTED IN NEW MEXICO IN 1916¹

PAUL C. STANDLEY

During August and September, 1916, the writer spent four weeks at Ute Park, Colfax County, New Mexico. This locality is in the extreme northern part of the State, 60 miles southwest of Raton, and not far from the Colorado boundary. The altitude of the station is approximately 2350 meters, and the mountains in the vicinity reach an elevation of 3650 meters. The region is typical of many others in the southern Rockies. Ute Park lies about on the border between the Upper Sonoran and Transition zones. The Upper Sonoran vegetation, confined to the lower levels and drier hillsides, is characterized by pinyon and cedar, while the Transition vegetation, of the more elevated mountain sides, is dominated by the Rocky Mountain yellow pine. At higher levels the Canadian Zone, with its heavy forests of fir and Douglas and other spruces, is extensively represented, and on the highest peaks there is a well developed Arctic-Alpine Zone.

While the writer was interested primarily in the flowering plants, he devoted a large part of his time to the systematic collection of cryptogams, especially rusts. Of the latter nearly a hundred numbers were collected, 17 of which represent species new to the State,² while many others are the basis of new host records for New Mexico. In all 55 species of Uredinales were collected. The writer is inclined to believe that this number includes most of the representatives of the rust flora of the locality at this particular season.

In the following list the species formally listed are either new to the State (indicated by an asterisk) or are reported here upon hosts hitherto unrecorded for New Mexico. A few new

¹ Published by permission of the Secretary of the Smithsonian Institution.

² See Paul C. Standley, *Fungi of New Mexico*, *Mycologia* 8: 142-177. 1916.

records are included from sources other than the writer's collections, but unless otherwise noted all the material was obtained at Ute Park. The numbers in parenthesis are the writer's collection numbers, specimens of which are deposited in the U. S. National Herbarium.

For the identifications of the rusts as well as for other assistance in the preparation of the present paper, the writer is deeply indebted to Dr. J. C. Arthur. The Ustilaginales have been determined by Mr. H. R. Rosen, formerly of the U. S. National Herbarium.

UREDINALES

*ALLODUS COMMUTATA (Syd.) Arthur

Reported from New Mexico, upon *Valeriana* sp. by Orton.³

*ALLODUS DOUGLASII (Ellis & Ev.) Orton

Reported from New Mexico, upon *Phlox* sp., by Orton.⁴

*ALLODUS VERTISEPTA (Tracy & Gall.) Arthur

[*Puccinia vertisepta* Tracy & Gall. Jour. Myc. 4: 21. 1888].

The type was collected in New Mexico, on "*Salvia ballotae-flora*."

COLEOSPORIUM RIBICOLA (Cooke & Ellis) Arthur

[*Peridermium ribicola* Long]

On *Ribes aureum* Pursh (13309), *R. inebrians* Lindl. (13669), and *Grossularia inermis* (Rydb.) Cov. & Britt. (13728). These are all new hosts for the State. Also found at Ute Park on *Ribes Wolfii* Rothr. (14165). In the North American Flora this rust is not reported on either *Grossularia inermis* or *Ribes Wolfii*. In the case of the latter host the writer was able to find only a single rusted leaf, but on the other hosts the rust was extremely abundant.

Long⁵ reports the aecial stage of this rust from the Sandia Mountains on *Pinus edulis* Engelm. He also reports the coleo-

³ Mem. N. Y. Bot. Gard. 6: 294. 1916.

⁴ Mem. N. Y. Bot. Gard. 6: 199. 1916.

⁵ Mycologia 8: 309-311. 1916.

sporial stage from the Santa Fe National Forest, on *Ribes mescalegium* Coville. The host is probably rather *R. inebrians* Lindl., for *R. mescalegium*, so far as known to the writer from collections, is confined to the southern part of the State. In addition, Mr. Long reports the colesporial stage from Albuquerque, on *Ribes "longifolium"* [*longiflorum?*], a name doubtless to be corrected to *R. aureum*. *R. longiflorum* is not known to occur in New Mexico.

CRONARTIUM COLEOSPORIOIDES (Diet. & Holw.) Arthur

On *Pedicularis Grayi* A. Nels., a new host record for the State (14270). Also on *Castilleja sulphurea* Rydb. (with *Puccinia Andropogonis* Schw.) (14075), *C. linariaefolia* Benth. (14275), and *C. integra* Gray (14712).

*GYMNOSPORANGIUM BETHELI Kern

I. On *Crataegus erythropoda* Ashe (13384). II. On *Juniperus scopulorum* Sarg. (14619). Prolonged search failed to reveal more than a single "cedar apple."

MELAMPSORA BIGELOVII Thüm.

New host records for the State are *Salix cordata Watsoni* Bebb (13564) and *S. subcaerulea* Piper (13758). The latter appears to be a new host for the species.

Dr. Arthur writes that the hosts of two collections reported by the writer⁶ as on *Salix* sp. have now been determined as follows: *Standley* 7713, from the Tunitcha Mts., is on *S. Scouleriana* Barratt; and *Standley* 7161, from Farmington, is on *S. Wrightii* Anderss.

MELAMPSORA LINI (Schum.) Desmaz.

II, III. On *Cathartolinum australe* (Heller) Small, a new host for the species (14091, 14543). Also on *Linum Lewisii* Pursh (13864).

*PHRAGMIDIUM ANDERSONI Shear

On *Dasiphora fruticosa* (L.) Rydb. (13321).

⁶ Mycologia 8: 153. 1916.

PHRAGMIDIUM MONTIVAGUM Arthur

A new host for the State is *Rosa Maximiliani* Nees (13308, 14587); also on *R. Fendleri* Crép. (14649).

PHRAGMIDIUM PECKIANUM Arthur

Heretofore this rust and its host, *Oreobatus deliciosus* (James) Rydb., have been known in New Mexico only from Sierra Grande. Both were abundant on the dry hills about Ute Park (13697).

PUCCINIA ABSINTHII DC.

III. On *Artemisia dracunculoides* Pursh (13666), a new host for the State. Also on *A. redolens* Gray (13894).

In the writer's previous list of New Mexican rusts⁷ a species "*Puccinia Artemisiae* DC." was cited. There is no such species, the name having been a slip of the pen for *P. Absinthii* DC., and the collections enumerated should be referred to the latter species.

*PUCCINIA AEMULANS Sydow

II, III. On *Gymnolomia multiflora* (Nutt.) Benth. & Hook. (13651).

*PUCCINIA ANDROPOGONIS Schw.

[*Aecidium micropunctum* Ellis & Ev.]

On *Castilleja sulphurea* Rydb. (with *Cronartium coleosporioides*) (14075a), *Andropogon scoparius* Michx. (with *Puccinia Ellisiana*), II (13575), and *Pentstemon Torreyi* Benth., I (14182).

*PUCCINIA ASTERIS Duby

On *Aster Wootonii* Greene (14063).

PUCCINIA CIRSII Lasch.

On *Cirsium ochrocentrum* Gray (13304, 13570) and *C. coloradense* (Rydb.) Cockerell (13561), both new hosts for the State.

PUCCINIA CLEMATIDIS (DC.) Lagerh.

New hosts for the State are *Bromus ciliatus* L., III (13652), *Agropyron tenerum* Vasey, II, III (13682), and *Bromus Porteri*

⁷ Mycologia 8: 156. 1916.

(Coult.) Nash (14524). Also found on *Elymus canadensis* L., II, III (13798), and *Clematis ligusticifolia* Nutt., I (13885).

*PUCCINIA CLINTONII Peck

On *Pedicularis fluviatilis* Heller (14485).

*PUCCINIA CONFERTA Diet. & Holw.

On *Artemisia albula* Wooton: Organ Mts., Aug. 16, 1895, Wooton.

PUCCINIA ELLISIANA Thüm.

II, III. On *Andropogon scoparius* Michx. (with *Puccinia Andropogonis*) (13575). Reported from New Mexico previously (I) on *Viola pedatifida* Don.

*PUCCINIA EPIPHYLLA (L.) Wettst.

II. On *Poa Bigelovii* Vasey & Scribn. (13673, 13890) and *P. pratensis* L. (13892).

*PUCCINIA GENTIANAE (Str.) Link

On *Dasystephana Bigelovii* (Gray) Rydb. (13865).

PUCCINIA GROSSULARIAE (Schum.) Lagerh.

II. On *Carex nebraskensis* Dewey (13905). Only the aecial stage reported from the State previously.

*PUCCINIA HIERACII (Schum.) Mart.

On *Hieracium Fendleri* Gray (13361).

*PUCCINIA KUHNIAE Schw.

On *Kuhnia rosmarinifolia* Vent. (14116).

PUCCINIA MENTHAE Pers.

A new host for the State is *Monarda comata* Rydb. (13312, 14632). Also on *Monarda stricta* Wooton, II, III (14074, 14741).

*PUCCINIA MILLEFOLII Fckl.

On *Achillea lanulosa* Nutt. (14077).

PUCCINIA MUHLENBERGIAE Arth. & Holw.

II, III. On *Muhlenbergia trifida* Hack. (13663, 14525), a new host for the State.

PUCCINIA POCULIFORMIS (Jacq.) Wettst.

II, III. On *Agropyron tenerum* Vasey (13959) and *Triticum aestivum* L. (14590), both new host records for New Mexico.

PUCCINIA PSEUDOCYOPTERI Holway

II, III. On *Pseudocymopterus multifidus* Rydb. (13655). Reported from the State previously on *P. montanus*.

*PUCCINIA SAXIFRAGAE Schlecht.

On *Micranthes arguta* (Don) Small (13642) and *Heuchera parvifolia* Nutt., III (13804).

PUCCINIA SHERARDIANA Körn.

On *Malvastrum coccineum* (Pursh) Gray (14566), a new host for the State.

*PUCCINIA SUBDECORA (Syd.) Holway

I. On *Coleosanthus grandiflorus* (Hook.) Kuntze (13383).

*PUCCINIA SUBSTERILIS Ellis & Ev.

On *Stipa Vaseyi* Scribn. (13574) and *S. Scribneri* Vasey, II, X (14594).

*PUCCINIA TARDISSIMA Garrett

On *Arenaria Fendleri* Gray (13580).

PUCCINIA TUBERCULANS Ellis & Ev.

A new host for the State is *Sideranthus spinulosus* (Pursh) Sweet (14445).

PUCCINIA UNIVERSALIS Arthur

I. On *Artemisia gnaphalodes* Nutt. (13352). II, III. On *Carex Douglasii* Boott (13578, 14442). Both are new hosts for the State, the only previous record being the aecial stage on *Artemisia franserioides*.

PUCCINIA VIOLAE (Schum.) DC.

Dr. Arthur writes that a specimen in the herbarium of the New York Botanical Garden, probably on *Viola pedatifida* Don, was collected at the mouth of Sapello Canyon, September, 1901, by Prof. T. D. A. Cockerell.

UROMYCES FABAE (Pers.) De Bary

On *Lathyrus decaphyllus* Pursh (13741) and *L. arizonicus* Britton (13774), new hosts for the State. Also on *Lathyrus leucanthus* Rydb., II, III (13645) and *Vicia americana* Muhl. (14424).

UROMYCES GENTIANAE Arthur

II. On *Amarella strictiflora* (Rydb.) Greene (13778). Reported from the State previously on *A. heterosepala*.

*UROMYCES GRAMINICOLA Burrill

II, III. On *Panicum virgatum* L. (13685). In the North American Flora this rust is not reported from west of Kansas and Oklahoma.

*UROMYCES HEDYSARI-OBSCURI (DC.) Wint.

II, III. On *Hedysarum pabulare* A. Nels. (13394).

UROMYCES INTRICATUS Cooke

[*U. Eriogoni* Ellis & Hark.]

A new host for the State is *Eriogonum Jamesii* Benth. (13800). Also on *E. racemosum* Nutt. (14711), only a single rusted leaf found after much search; usually the rust is very abundant on this species in New Mexico.

UROMYCES PROEMINENS (DC.) Pass.

II. On *Poinsettia dentata* (Michx.) Klotzsch & Garcke, at Raton (13261), a new host for the State. Also on *Chamaesyce serpyllifolia* (Pers.) Small, II, III (14233).

UROMYCES PUNCTATUS Schroet.

[*U. Astragali* Sacc.]

A new host for New Mexico is *Oxytropis deflexa* (Pall.) DC. (13860).

The following additional rusts were collected at Ute Park, all on hosts upon which they have been found in the State previously: *Aecidium Compositarum* Auct., on *Dugaldia Hoopesii* (Gray) Rydb. (13756); *Melampsora albertensis* Arthur, on *Populus aurea* Tidestrom, apparently scarce (14550); *Phragmidium imitans* Arthur, on *Rubus arizonicus* (Greene) Rydb. (14650); *Phragmidium Potentillae* (Pers.) P. Karst., II, III, on *Potentilla strigosa* Pall. (13916); *Puccinia Grindeliae* Peck, on *Grindelia aphanactis* Rydb. (13639, 14589); *Puccinia Helianthi* Schw., on *Helianthus annuus* L., very scarce, although sunflowers grew everywhere (14467); *Puccinia hemispherica* Peck, III, on *Lactuca pulchella* (Pursh) DC. (13569, 14257); *Puccinia Oxalidis* (Lev.) Diet. & Ellis, on *Ionoxalis violacea* (L.) Small (14691); *Puccinia Taraxaci* Plowr., on *Taraxacum taraxacum* (L.) Karst. (14581); *Pucciniastrum Agrimoniae* (Schw.) Tranz., II, on *Agrimonia striata* Michx. (14643); *Pucciniastrum pustulatum* (Pers.) Dietel, II, on *Epilobium novomexicanum* Hausskn. (13903); *Uromyces Rudbeckiae* A. & H., on *Rudbeckia laciniata* L. (13735); *Uropyxis sanguinea* (Peck) Arthur, on *Odostemon repens* (Lindl.) Cockerell (13585).

USTILAGINALES

USTILAGO BROMIVORA (Tul.) Fisch. de Waldh.

A new host for the State is *Bromus Richardsoni* Link (14148). Also on *B. polyanthus* Shear (13797).

*USTILAGO CRUS-GALLI Tracy & Earle

On *Echinochloa zelayensis* (H.B.K.) Schult. (14784). Apparently a new host for the species.

USTILAGO HORDEI (Pers.) Kell. & Swingle

On *Hordeum trifurcatum* Jacq., cultivated (13796).

USTILAGO HYPODYTES (Schlecht.) Fr.

On *Sitanion longifolium* J. G. Smith (14114), a new host for the State. Also on *Stipa Vaseyi* Scribn. (14703).

Ustilago levis was collected also, abundant on cultivated oats (14440).

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